directions lying in the plane and being generally orthogonal to each other and the third direction being generally orthogonal to the first and second directions;

determining resultant torques about the first, second and third directions between the magnet array and the coil array, which would be generated by the forces generated by the determined currents;

determining current adjustments to compensate for the resultant torques such that torques about the first, second, and third directions become desired values while the forces in the first, second, and third directions remain the same; and

applying a sum of the determined currents and determined current adjustments to the coils to interact with the magnetic fields of the magnet array to control the planar electric motor.

3. (Amended) The method of claim 1, wherein the currents to be applied to coils in a portion of the coil array within the magnetic fields of the magnet array are sinusoidal, triangular or square waveforms.

6. (Amended) The method of claim 1, wherein the currents to be applied to the coils are determined only for coils in a predetermined portion of the coil array.

9. (Amended) The method of claim 1, wherein the coils in a portion of the coil array within the magnetic fields of the magnet array comprise twenty-five or fewer coils.

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10. (Amended) The method of claim 1, wherein the coils in a portion of the coil array within the magnetic fields of the magnet array comprise twelve or more coils.

11. (Amended) The method of claim 1, wherein the coils in a portion of the coil array within the magnetic fields of the magnet array comprise sixteen or more coils.

12. (Amended) A method for determining current to be applied to control a planar electric motor in six degrees of freedom, the motor having a magnet array and a coil array having coils generally disposed in a plane, comprising:

determining currents to be applied to coils for generating forces between the magnet array and the coil array in first, second, and third directions, the first and second directions lying in the plane and being generally orthogonal to each other and the third direction being generally orthogonal to the first and second directions, the currents being dependent upon the position of the magnet array and desired forces in the first, second, and third directions;

determining resultant torques, which would be generated by the determined currents; and

determining current adjustments to be added to the determined currents to compensate for the resultant toques such that torques about the first, second, and third directions become desired values while the forces in the first, second, and third directions remain equal to the desired forces.

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15. (Amended) The method of claim 14, wherein the coils in the portion of the coil array include coils partially within the magnetic field of the magnet array.

16. (Amended) The method of claim 12, wherein the step of determining the currents to be applied to the coils comprises determining the currents to be applied to twenty-five or fewer coils.

17. (Amended) The method of claim 12, wherein the step of determining the currents to be applied to the coils comprises determining the currents to be applied to twelve or more coils.

18. (Amended) A method for positioning an object in a lithography system, comprising:

providing a frame;

providing a stage for supporting the object and movable to position the object relative to the frame in six degrees of freedom;

providing a coil array attached to the frame, the coil array having coils;

providing a magnet array adjacent a portion of the coil array, the magnet array being attached to the stage and having magnets generally disposed in a plane, the plane defining first and second directions and a third direction being generally orthogonal to the plane;

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determining currents to be applied to coils in the portion of coil array to generate forces between the magnet array and the coil array in the first, second, and third directions;

determining a resultant toque between the magnet array and the coil array, which would be generated by the forces;

determining current adjustments to compensate for the resultant torque such that a torque between the magnet array and the coil array becomes a desired value while the forces in the first, second, and third directions remain the same; and

applying a sum of the determined currents and determined current adjustments to the coils to interact with magnetic fields of the magnet array.

19. (Amended) The method of claim 18, further comprising determining a position of the magnet array relative to the coil array and using the position of the magnet array in determining the currents, resultant toque or current adjustments.

20. (Amended) The method of claim 18, wherein the currents to be applied to coils in the portion of the coil array are sinusoidal, triangular or square waveforms.

23. (Amended) The method of claim 18, wherein the currents to be applied to the coils are determined only for coils in the portion of the coil array.

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29. (Amended) A method for determining current to be applied to control a planar electric motor in six degrees of freedom, the motor having a magnet array and a coil array having coils generally disposed in a plane, comprising:

determining a position of the magnet array relative to the coil array in X, Y, and Z directions, the X and Y directions being defined by the plane and the Z direction being generally orthogonal to the X and Y directions;

determining desired forces R_x, R_y, and R_z in the X, Y, and Z directions, respectively, for independently controlling the magnet array to move relative to the coil array in the X, Y, and Z directions;

determining currents to be applied to the coils for generating the desired forces R_x, R_y, and R_z between the magnet array and the coil array;

determining a resultant torque, which would be generated by the currents according to the position of the magnet array relative to the coil array and the desired forces R_x, R_y, and R_z; and

determining current corrections Δ_x, Δ_y, and Δ_z to be added to the currents, to produce desired torques T_x, T_y, and T_z about the X, Y, and Z directions while forces F_x, F_y, and F_z in the X, Y, and Z directions remain equal to the desired forces R_x, R_y, and R_z.

32. (Amended) A planar motor comprising:

a first member;

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a second member interacting with the first member to generate driving force, the second member being movable relative to the first member in six degrees of freedom including first, second, and third directions by the driving force; and

a controller connected to at least one of the first and second members, the controller determining information related to resultant torques about the first, second, and third directions between the first member and the second member, which would be generated by the driving force, the controller determining adjustment information to compensate for the resultant torques such that torques about the first, second, and third directions become desired values while the driving force remains the same.

33. (Amended) The planar motor of claim 32, further comprising a measuring system connected to the controller, the measuring system detecting information related to the relative position between the first member and the second member; and wherein the controller determines the resultant torques based on the information related to the relative position between the first member and the second member.

35. (Amended) The planar motor of claim 32, wherein the controller outputs the adjustment information to at least one of the first and second members.

37. (Amended) The planar motor of claim 32, wherein the first member includes a magnet array having magnets and the second member includes a coil array having coils generally disposed in a plane, the plane defining the first and second directions.

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